Association for Information Systems
AIS Electronic Library (AISeL)

UK Academy for Information Systems Conference Proceedings 2011

UK Academy for Information Systems

Spring 4-11-2011

The Applicability of E-Commerce Technology Acceptance (ECTA) Framework for SMEs in Middle Eastern Countries with Focus on Jordan Context

Ahed Al-Haraizah
Al-AhliyyaAmman University Amman, Jordan, Haraizah@ammanu.edu.jo

THE APPLICABILITY OF E-COMMERCE TECHNOLOGY ACCEPTANCE (ECTA) FRAMEWORK FOR SMES IN MIDDLE EASTERN COUNTRIES WITH FOCUS ON JORDAN CONTEXT

Empirical evidence from electronic commerce in SMEs

Ahed, S, Al-Haraizah
Al-Ahliyya Amman University Amman, Jordan
Email: Haraizah@ammanu.edu.jo

Abstract

An adoption of appropriate technology can lead the company to greater business competency, improve its business performance, and ensure it retains its competitive advantages. Despite this awareness, many SME in the developing countries in the Middle East have yet to fully embrace this adoption of ecommerce in the running of their business. The problem in this research is to identify and bring together in one framework the appropriate issues, variables, components and concepts that need to be addressed to encourage, motivate and enable SME's in Middle Eastern countries to adopt electronic commerce technology in the running of their businesses.

The aim of this study is to develop a comprehensive research framework called Electronic Commerce Technology Acceptance (ECTA) framework, which is utilised for discovering the factors affecting the adoption of e-commerce innovation and to apply this framework for empirically testing the adoption of e-commerce application by SMEs in Middle Eastern Countries. This empirical study was conducted through survey research and the sample was drawn by means of systematic sampling technique. The empirical data were collected by using self-administrated questionnaires and semi-structured interviews.

The data analysis is based on 400 Jordanian SMEs; also data analysis was based on multivariate statistical techniques encompassing multiple linear regression, simple linear regression, and one-way ANOVA. The findings from this research show that the ECTA framework is beneficial to both governmental and private sectors who intend to accelerate the adoption rate of electronic commerce implementations and their relevant components among SMEs in Jordan.

Keywords: SMEs, ECTA, E-Commerce Technology.

1. Introduction

Advances in information and communication technologies and the emergence of the Internet have revolutionised business activities enabling new ways of conducting business referred to as electronic commerce (Zwass, 2003; Turban *et al*, 2004). Electronic commerce is viewed as a process of buying, selling, transferring, or exchanging products, services, and/or information through computer networks, mainly the Internet (Turban et al, 2004). Electronic commerce can also be defined as: "The sharing of business information, maintaining of business relationships, and conducting of business transactions by means of telecommunications networks" (Zwass, 2003, p. 8).

Various studies have reported that SMEs are generally lagging behind to large organisations as far as the adoption and usage of e-commerce is concerned (see for example Simpson & Docherty, 2004; Chau & Turner, 2002; Ihlstrum *et al*, 2003; Stockdale & Standing, 2006). This sluggish uptake and diffusion of the technology among SMEs conflicted with the commonly held view that SMEs have been noted for their ability to respond to new opportunities and innovations more quickly than larger enterprises (Lomerson et al, nd). Rao et al (2003) alluded to the fact that SMEs are generally considered to be flexible, adaptive and innovative making them a good fit for electronic commerce.

From the above, it can be noted that larger firms capture business opportunities on the Internet faster than smaller firms. With the rapid growth of registered domains and Internet users, it is logical to believe that most large firms are already connected to the Internet. Conversely; the Internet involvement rate of small and medium sized enterprises (SMEs) is low compared to larger firms.

Therefore, the current research's main area is "Electronic Commerce Technology Acceptance framework for Small and Medium-sized Enterprises in the Middle Eastern countries with focus on Jordan context". The purpose of this study is to examine some of the emerging issues surrounding the adoption and diffusion of e-commerce in the Jordanian SMEs sector. Furthermore, this research aims at providing a contribution in

understanding the benefits, usage, and barriers confronting the adoption of e-commerce among Middle Eastern-developing countries-particularly Jordanian SMEs.

2. The Theoretical Foundation of Research Framework

The framework to be embarked in the study to examine the research questions is constructed from several scholars who have studied different aspects of the necessary phenomenon of individual reactions to information technology, which is based on a variety of theoretical perspectives, consisting of: Technology Acceptance Model (TAM) (Davis, 1993, 1989; Davis et al, 1989; Venkatesh & Davis, 2000; Malhotra & Galletta, 1999; Liu & Ma, 2006; Bagozzi, 2007); Theory of Reasoned Action (TRA) (Fishbein & Ajzen,1975; Lukas & Spitler, 1999; Venkatesh & Davis, 2000, Mao & Palvia, 2006); Theory of Planned Behaviour (TPB) (Ajzen, 1985); Diffusion of Innovations Theory (IDT)(Rogers, 1995); and Social Cognitive Theory (Bandura, 1986; Compeau & Higgins, 1995a, 1995b; Hill et al, 1986, 1987).

Significantly, these paradigms have been acknowledged in the IS literature, as they enable researchers to gain a beneficial insight into the reaction of individuals toward computer technology and the factors that create the reactions. For instance, TRA is used to predict and understand intentions, behaviours and upshots related to consumer online shopping behaviour (Vijayasarathy, 2001). Song and Zahedi (2001) examined the effects of website design on the adoption of Internet shopping built on the model of the Theory of Planned Behaviour (TPB).

This research proffers valuable insight into the social stimulus, cognitive, affective, and behavioural reactions of individuals to technology; moreover, into the factors that influence their reactions. Because these five models (TRA, DOI, SCT, TPB, and TAM) are extensively used and referred to have validity in investigating factors affecting technology adoption, they are considered to be beneficial theories and then used as a theoretical foundation in developing a comprehensive research framework for this study. The framework (ECTA) is then developed to provide a comprehensive picture of

individual's behaviour towards the adoption and use of electronic commerce innovation in Jordan. These models and theories are clarified through the following segments.

2.1. Theory of Reasoned Action (TRA)

Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) focuses on two dependent factors for determining behavioural intention- the attitude towards behaviour and the attitude towards subjective norm. These determinants correspond to behavioural and normative beliefs where the former refers to the extent of the adopter's favourable or otherwise reaction (evaluation, appraisal, etc.) toward a given behaviour while normative beliefs considers the likelihood that referent persons approve or disapprove of performing a given behaviour. TRA with its robust nature lends itself well to generalization and has been applied to numerous areas consisting of the modelling of technology acceptance (Scannell, 1999).

The theory of reasoning action (TRA) as the basis of TAM is based on the assumption that human beings are rational animals that systematically use or process the information available to them (Fishbein, 1980). Though TRA is concerned with the determinants of human consciously intended behaviour, it is a widely investigated model in social psychology (Fishbein & Ajzen, 1975).

Moreover, it has been utilized to develop a common frame of reference for comparison of independent research studies technology on social systems, these models (Davis, 1986, 1989, Davis et al, 1989). Much less specific than TRA, this model incorporates components from the Information Systems literature , and assumes two key determinants for describing technology adoption behaviour-the technology perceived usefulness and its perceived ease of use. Subjective norms are not taken as important factors in this model. The figure 1 shows the TRA model.

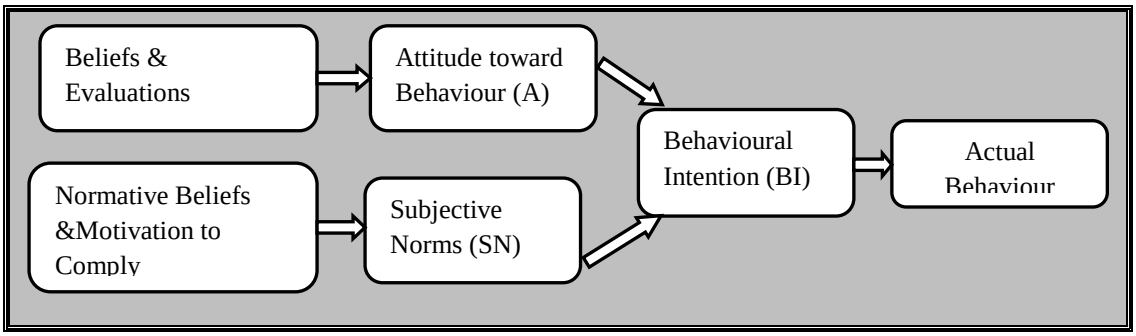

Figure1. Theory of Reasoned Action (Fishbein & Ajzen, 1975)

In this theory, an individual's performance of a particular behaviour is determined by his/her behaviour intention (BI) to perform the behaviour. The BI is determined by an individual's perception of personal factors; for example attitude (A) towards behaviour and Subjective Norm (SN); SN can be identified as what the consumer believes other people would think of the behaviour being performed, which is the social pressure of the behaviour in question (Fishbein & Ajzen, 1975; Fishbein, 1980).

Arrows in the TRA (figure 1) indicate the direction of the influence. Conventionally, the theory of reasoned action can be presented as follows (Fishbein & Ajzen, 1975, p.301):

$$B \sim BI = (AB)\, W1 + (SN)\, W2$$

Where **B**= a specific behaviour, **I**= consumer's intention to perform behaviour **B**, **AB=** consumer's attitude toward performing behaviour **B**, **SN**= subjective norm with respect to whether other people want the consumer to engage in that behaviour. **W1** and **W2**= empirically determined weights that represent the relative influence of **AB** and **SN**, and the components of **BI**.

As per TRA, attitudes are a function of beliefs. The beliefs that performing an act would lead to a positive outcome makes individuals to hold a positive attitude towards performing the behaviour, while a person who believes that performing would lead to mostly negative outcomes would hold an unfavourable attitude. The belief that underlie individual attitude towards the behaviour is termed as behaviour beliefs (Fishbein, 1979).

Subjective norms are the function of beliefs. That is, an individual believes that a specific group thinks he/she should or should not perform the behaviour. If the person believes that most referents think he/she should perform the behaviour, the perceived social pressure to perform would increase the more he/she is motivated to comply with each of referents. Vice versa, if an individual believes that most referents are opposed to his/her performing the behaviour, his/her perception of social pressure not to perform the behaviour will increase with the motivation to comply. Therefore, the belief underlying a person's beliefs is termed as the normative belief (Fishbein & Ajzen, 1975, P. 16; Ajzen & Fishbein, 1980, P.7).

Ajzen and Fishbein (1980, P. 172) stressed that consumer attitudes towards an object might need not have a systemic relation to consumer intentions or behaviour. Furthermore, they modified and extended the model to better relate to consumer's beliefs and attitudes to their behavioural intentions. In addition, the theory assumes that consumers consciously consider the consequences of the alternative behaviour under the consideration and choose the one that leads to the most desirable consequences. The outcome of this selection process is an intention to engage in the selected behaviour. Specifically, the theory suggests that voluntary behaviour is determined by the intention to perform the behaviour (Fishbein & Ajzen, 1975). The TRA identifies the variables that underlie consumers' intentions to perform a specific behaviour. Likewise, the TRA looks at intentions rather than attitudes as the most significant predictors of overt behaviour. Nevertheless, the measures of consumers' intention perhaps not always are perfect indicators of the intentions that in fact determine their behaviour. Basically, TRA proposes that an individual's behaviour is a function of both the individual's attitude toward a specific behaviour and the social influences and norms surrounding the behaviour.

2.2. Innovation Diffusion Theory

Diffusion of Innovation (DOI) is also known as Innovation Diffusion Theory (IDT). The DOI model was comprehensively developed by Rogers (1962, 1983, 1995, and 2003) to

interpret how, why, and at what rate new ideas and technology spread via specific a group of individuals and organisations. DOI is defined as

"the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1983, 1995).

DOI has been widely utilised and validated in several disciplines encompassing sociology, anthropology, education, marketing, business, and others. The framework of innovation adoption process was initially introduced in 1962 and has been extensively cited and studied in the literature since then. Rogers (2003) stressed that the adopters of any new innovation or notion can be classified into one of five categories: innovators, early adopters, early majority, late majority, and laggards. The innovation adoption process is presented in a bell curve in figure 2.

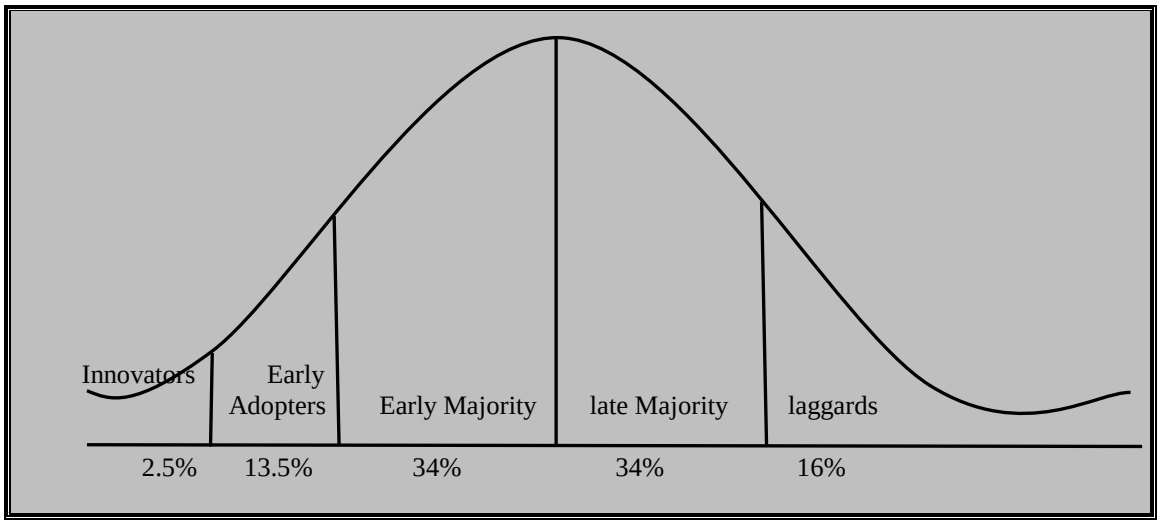

Figure 2. The innovation adoption process (Rogers, 2003, p. 281)

- **Innovators** – they are brave people who want to be the first to adopt and display behaviour, illustrating that they are likely to be at the forefront of a particular innovative idea or process. They count for 2.5% of the adopter group.
- **Early Adopter**- they are respected people; they are also quick to adopt new notions or processes but in a careful way. They tend to be opinion leaders since they are among the first to adopt the new thing. This group accounts for 13.5%.

- **Early Majority**- they are thoughtful people. They think more carefully than the early adopter group but still accept change more quickly than the average. They tend to stand back and watch the experience of others. This group accounts for 34%.
- **Late Majority**-they are sceptical people, who tend to adopt a new thing later than the average person. They are slower to catch onto the popularity of new ideas and solutions. They typically adopt a new thing when the majority is using it. Even they are also a large group, but they adopt a new thing after its newness has worn off. They account for 34%.
- **Laggards**- they are traditional people, who prefer the old traditional style. They are critical towards new ideas and will only accept it if the new idea has become mainstream or even tradition. This group accounts for 16%.

In terms of factors influencing the adoption of innovation, Rogers (1983, 2003) disputed that innovation characteristics are primary determinant in the innovation adoption process. Five attributes of innovation are determined: Relative Advantage, Compatibility, Observability, Complexity, and Trialability. The description of these attributes is explained as follows (Rogers, 2003):

- **Relative Advantage** refers to the degree a new innovation is perceived as better than current practices.
- **Compatibility** is the degree to which a new innovation is perceived to be consistent with the adopters' existing values, past experience and needs.
- **Observability** refers to the extent that the results of an innovation are easily seen and understood.
- **Complexity** refers to the perceived difficulty of learning to use and understand a particular new innovation.
- **Trialability** is the degree to which an innovation can be experienced with or used on a trial basis.

The above mentioned attributes have been considered the determinants of explaining the adoption rate. Figure 3 shows the factors impacting innovation adoption in the DOI model.

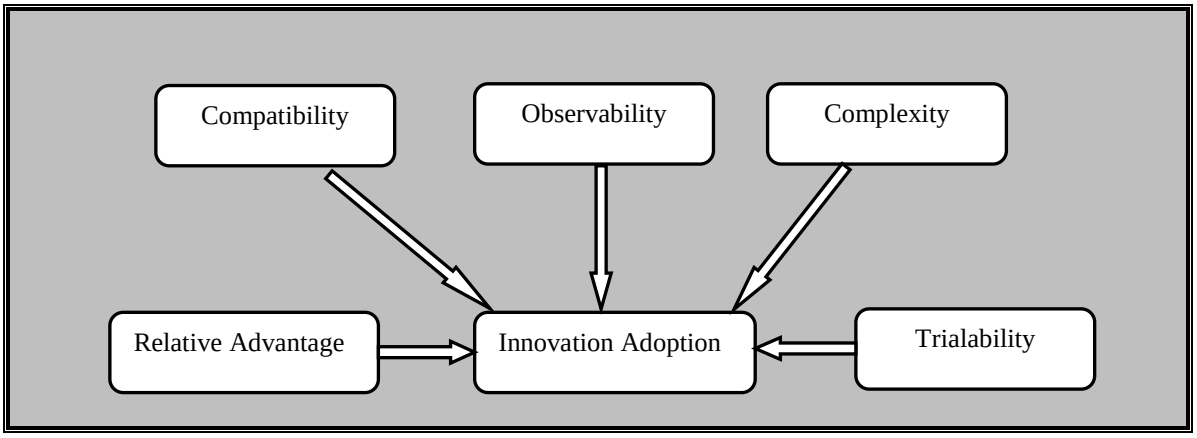

Figure 3. Innovation adoption based on the DOI concept

2.3. Social Cognitive Theory (SCT)

Social Cognitive Theory (SCT) was developed by Bandura (1986) who was influenced by the Social Learning Theory (SLT). The SCT evolved under the umbrella of behaviourism, which is a subset of psychological theories intended to explain why people and animals behave the way they do. The SCT defines human behaviour as an interaction of personal factors, behaviour, and the environment. As per this theory, Bandura (1986) acknowledged that an individual's behaviour is uniquely determined by each of the following three factors:

- **Personal factors**- A person's expectations, beliefs, self-perceptions, goals, and intentions shape and direct behaviour. Nevertheless, that is conducted while influence one's thoughts and emotions.
- **Environmental factors**- Human expectations, beliefs, and cognitive competencies are developed and adjusted by social influence and physical structures within the

environment. These social influences can convey information and activate emotional reactions such as modelling, instruction, and social persuasion.

- **Behavioural factors**- A person's behaviour will determine the facets of their environment to which they are exposed, and behaviour is, in turn, modified by that environment. This triadic reciprocal interaction is presented in the figure 3.

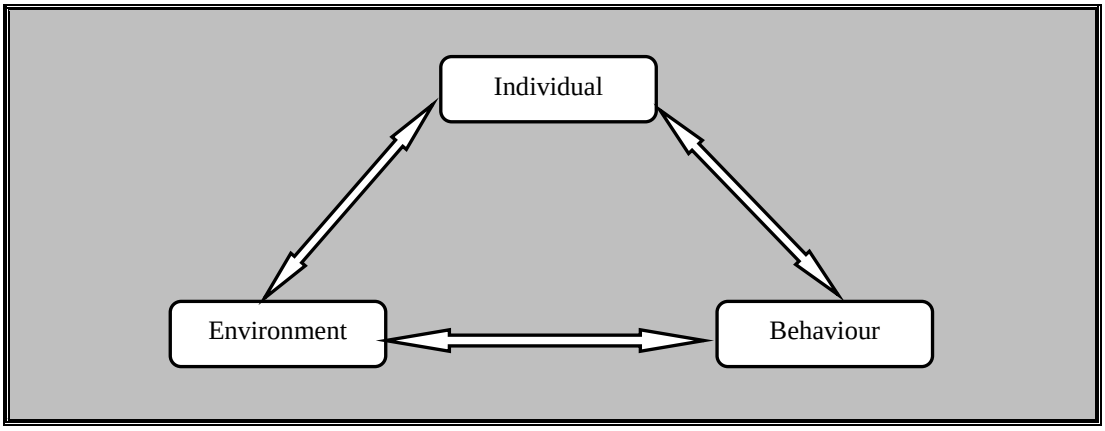

Figure 4. the Triadic Reciprocal Interaction of SCT

Compeau and Higgins (1995a, 1995b) applied and extend SCT to the context of computer usage and adoption. The emphasised the role of cognitive components within the original SCT model. There are two sets of expectations as the major cognitive forces guiding behaviour. The first set relates to outcomes, individuals are more likely to accept behaviours they believe will result in appreciated outcomes than those they do not see as having favourable outcomes. The second set of expectations is called self-efficacy, reflecting the beliefs about one's ability to perform a specific behaviour. Self-efficacy affects choices about which behaviours to accept, the effort and persistence exerted in the face of obstacles to the performance of those behaviours, and thus the mastery of the behaviours. According to the second set of expectations, self-efficacy, Compeau and Higgins (1995b) extend the dimension of self-efficacy into the context of technology. Computer Self-efficacy is developed and defined as a judgment of one's ability to use a technology to accomplish a particular job or task. Three dimensions of computer Self-efficacy have been clarified through the following section (Compeau & Higgins, 1995b):

- **Magnitude**- the level of capability expected. Individuals with a high computer self-efficacy magnitude may be expected to perceive themselves as able to accomplish more difficult computing tasks as those with lower judgments of self-efficacy. In addition, it also based on the support levels required to perform a task. Individuals with a high magnitude of computer self-efficacy might judge themselves as capable of operating with less support and assistance than those with lower judgments of Self-efficacy magnitude.
- **Strength**- the level of conviction about the judgment, or the confidence an individual has with regards to his/her ability to accomplish the various technology related tasks. Individuals with high computer Self-efficacy will perceive themselves as able to perform more difficult tasks (high magnitude) and will also display greater confidence regarding their ability to successfully overcome whatever obstacles exist.
- **Generalisability**- the degree to which the judgment is limited to a specific situation. In terms of a computing context, the situation might be considered as different hardware and software configurations, consequently, individuals with high computer Self-efficacy Generalisability are predicted to be capable to competently use various software packages and different computer systems, whereas individuals with low Self-efficacy perceive their capabilities as limited to particular software packages or computer systems.

Besides computer self-efficacy and outcomes expectation, the model (Compeau & Higgins, 1995b) implies two more factors that also impact the usage of technology; affect and anxiety. Affect refers to an individual's liking for a particular behaviour, in contract; anxiety refers to negative feelings such as worry and nervousness toward technology use. This model is presented in figure 5.

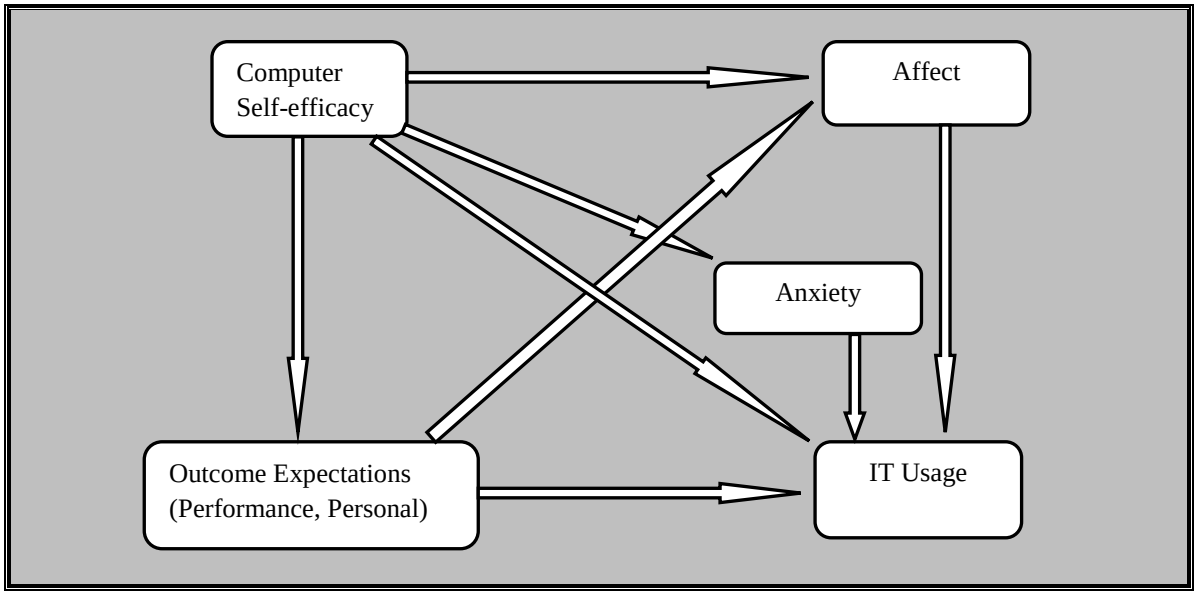

Figure 5. IT Usage based on the SCT Concept

2.4. Theory of Planned Behaviour (TPB)

The theory of Planned Behaviour (TPB) was originally built on the Theory of Reasoned Action (TRA). Ajzen (1985, 1991) extends TRA by adding a new component that is perceived behavioural control to the original TRA form as an additional determinant of intention and behaviour. TPB postulates that behaviour is a direct function of behavioural intention which is determined by three components: Attitude, Subjective Norm, and perceived behavioural control. Attitude and Subjective Norm are consistent with the original TRA model, while perceived behavioural control, which distinguishes this model from TRA that represents the perceived ease or difficulty of performing the behaviour and relies on past experience and future obstructions. The figure 6 illustrates the framework of TPB.

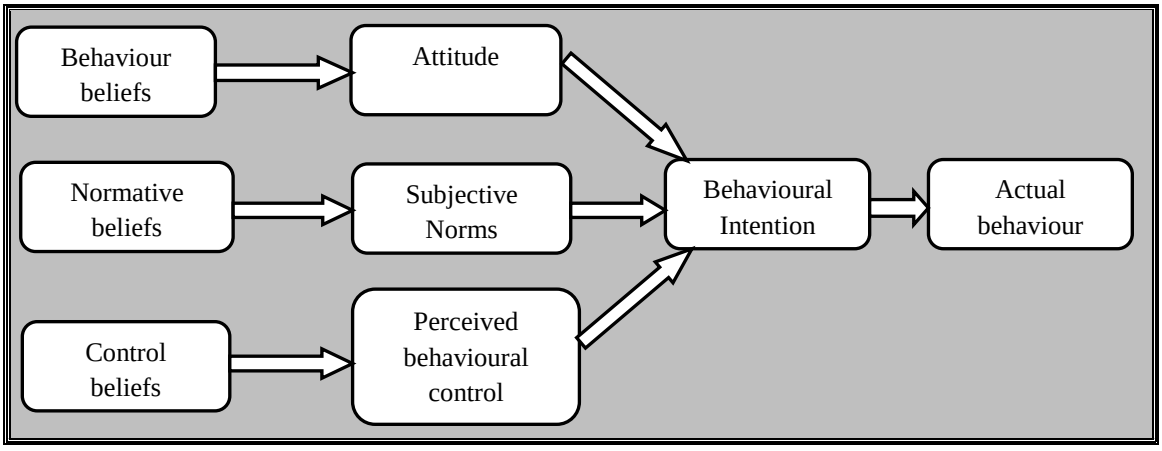

Figure 6.Theory of Planned Behaviour (TPB)

2.5. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was suggested by Davis (1989) and Davis et al (1989) as an instrument to predict the likelihood of new technology being adopted within a group or an organization. Fundamentally, it was originated from the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) and in addition it proposes that technology acceptance and use can be explained in the context of an individual's internal beliefs, attitudes and intentions. The original TAM measured the impact of four internal variables upon the actual use of the technology. Therefore, the internal variables in the original TAM are: perceived ease of use (PEU), perceived usefulness (PU), attitude toward use (A), and behavioural intention to use (BI). The model stresses that technology acceptance and usage is determined by intention to use, which determines the actual systems use. Davis et al (1989) discussed that intention to use new technology can be explained in two ways: first, when both perceived usefulness and perceived ease of use are both positive, individuals will create intention to perform behaviours on the basis of positive attitude; second, individuals will provoke the intention toward behaviours that is believed to be useful for a job performance without concerning either the ease of use is negative or positive.

The objective of TAM is to provide an explanation of the determinants of computer acceptance that is commonly capable of explaining the behaviour of users across a broad

range of end-user computing technology and user populations, while concurrently being both parsimonious and theoretically justified (Davis et al, 1989, P. 985).

TAM uses TRA to identify causal linkages between relevant sets of constructs, Perceived Usefulness (PU), Perceived Ease of Use (PEOU), user Attitude toward Using (ATU), Behavioural Intention (BI), and Actual computer Usage behaviour (AU).

Davis et al (1989, P.985) defined Perceived Usefulness (PU) as the user's *"subjective probability that using a specific application system will increase his/her job performance within an organisation context"*. Also, Perceived Ease of Use (PEOU) is defined as *"the degree to which an individual believes that using a particular system would be free of physical and mental effort"* (Davis, 1993, P.447). Merely, the more useful and easier to use the technology is, the more likely the user would use it. Or, whereas, PU is concerned with the expected overall influence of system use on job performance (process and outcome), PEOU pertains only those performance impacts related to the process of using the system per se (Davis, 1993, P.447).

The upshots of prior studies (Davis, 1989, P.1000; Davis et al, 1989, P.333) have confirmed that the perceived usefulness is more strongly linked to IT adoption and usage than perceived ease of use as individuals may be willing to tolerate a complex technology to gain an advantage from IT adoption. As a result, it can be inferred that the perceived benefits from individual perception impact the decision-making process of IT adoption.

Both of the keys construct, PU and PEOU in the TAM paradigm, predict an individual's attitude towards using a computer system. PU and PEOU will influence an individual's AU. ATU will influence the BI, and in turn, Actual use of the system (AU). Actual Use (AU) will be predicted by the individual's BI. Davis (1986) and Davis et al (1989) clarified that the arrows in the TAM model to demonstrate the probable causality, as illustrated in Figure 7.

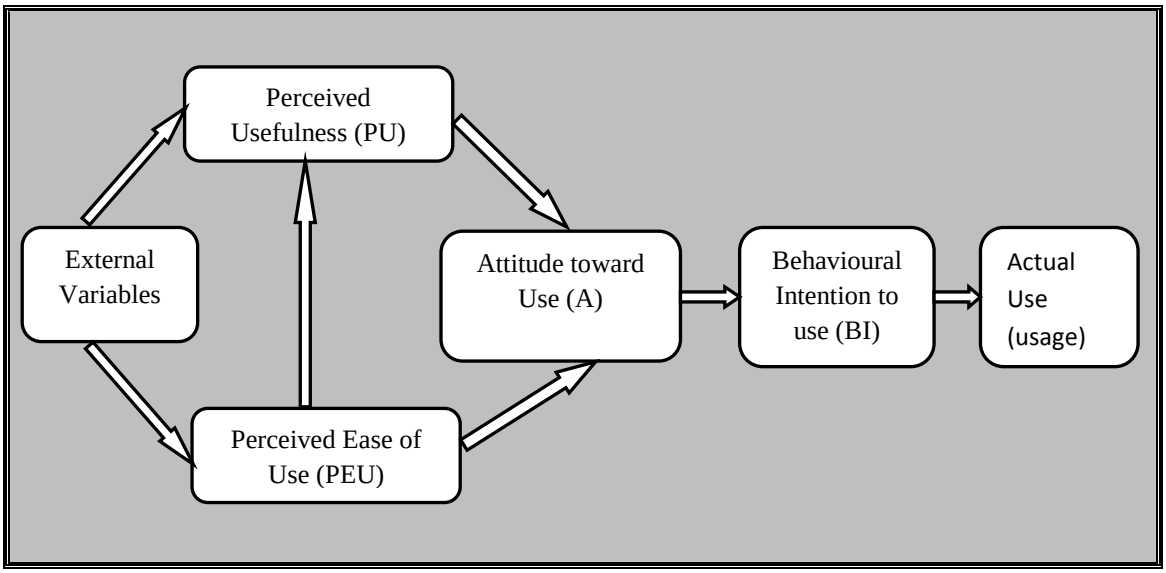

Figure 7. Technology Acceptance Model (TAM) based on Davis (1989)

2.7. Electronic Commerce Technology Acceptance (ECTA) Framework

The extensive literature review in chapter two as well as models introduced in the current chapter these undoubtedly provide evidence that the five adoption models are applicable for examining determinant factors in several technological innovations. The five adoption models (TRA, TAM, TPB, SCT, and DOI) are considered to be beneficial theories and then utilised as a theoretical foundation in developing a comprehensive research framework for this study. The framework is developed in three steps. First, the five adoption models are merged since their constructs overlapped. This is to eradicate repetition between models. Second, the important additional components investigated in prior studies are integrated into the research framework. Lastly, all proposed determinant factors are associated in the comprehensive research framework.

2.8. The Concurrence of the Existing Five Adoption Model

There are similarities and differences in the theoretical constructs of TRA, DOI, SCT, TPB, and TAM. Merely, they are all similar in that they tend to predict and articulate

individuals' behaviour toward technological innovation, for instance adopting, applying, accepting, and using e-commerce innovation. However, they are inconsistent in their emphasised context and the terminologies they use. In other words, in each model, behaviour is determined by a set of beliefs toward a specific technological innovation and a set of affective responses to the behaviour. The affective responses are illustrated by perceived usefulness and perceived ease of use in TAM; by attitude, subjective norm, and perceived behavioural control in TPB; by attitude toward behaviour and subjective norm in TRA; by self-efficacy, affect, anxiety, and outcome expectations in SCT; and by the perceived characteristics of innovation in DOI. In the present framework (ECTA), the behavioural response determined by the adoption of e-commerce innovation that affected by e-commerce use intention, which is impacted by Affective responses reflected by sentiment toward e-commerce acceptance that is affected by cognitive responses presented by perceived advantage, perceived usability, and e-commerce perception accuracy, which in turn influenced by social stimulus components presented by trust dimensions, culture dimensions, and sociology of technology dimensions.

E-commerce acceptance and adoption has been widely investigated in developed countries, which is created in, and for, those countries. All models mentioned previously have been the basis of most of the research into technology diffusion. Moreover, the most of examined studies were conducted in the USA and other developed countries, because of this exclusive of the use of adoption models. It seems that there is a sort of significance to undertake a research into the adoption of new technology, for instance E-commerce technology, in the circumstances of lagging behind countries, such as those in the Middle East.

There is no exaggeration to assert that there is no empirical evidence that information technology acceptance models, established in developed countries, can be applied equally to developing countries without bearing in mind some amendments to account for the variation in context. Nonetheless, it is not unreasonable to presume that the need for some modifications may be the case. A globally applicable model must hold relevance across the broad field of information technology implementations and should also encompass a

high probability of success in the relocation of various technologies across economic and cultural boundaries.

The proposed research investigates the appropriateness of the ECTA framework for the study of electronic commerce technology in the Middle East countries with a specific focus on the Jordanian context. This is to be done by examining the literature, which suggests that models of information technology adoption and use in advanced countries perhaps not be thoroughly applicable to developing countries. Furthermore, literature survey and research findings will thereafter be analysed to recommend the developed electronic commerce acceptance framework in order to make it more relevant for research on technological acceptance and adoption in the circumstance of developing countries such as Middle East countries or other parts in the world.

The significance of the ECTA framework emanated from the incorporation of several factors that have already been demonstrated in respect to trust (Gefen et al, 2003; Gefen et al, 2005). This research has led to a comprehensive framework to include sets of factors that relate to the main determinants of sentiment and behaviour in the acceptance and use of technology. These factors presented by Culture (Hofstede, 1980, 2001; Gefen et al, 2005; Straub et al, 1997); and sociology of technology (Chow & Chan, 2008; Qiao, 2008; Previte, 2005; Deroian, 2002). In this framework, PA, PU, ECPA, and STECA are intermediate states, dependent on other independent variables which can be determined in the context of the study and will be examined to inspect how they directly affect PA and PU.

This research acknowledges that there are many factors that could influence the acceptance and adoption of electronic commerce technology in Middle Eastern countries. Some of these factors might not be recognised in the existing literature on IT adoption as most research has taken place in advanced countries, where, the technology was originally created. A review of the literature and survey study in the Jordanian context proposes that information technology models, which have been widely studied, revised, and referred into the research of IT diffusion, may be serviceable; in spite of this fact it

may require to be more comprehensive and include specific issues of trust, cultural beliefs, and sociology of technology. This is shown in figure 8.

The aforementioned factors need to be sought deeply to determine a more detailed understanding of the factors themselves and their influences on user behaviour, it is recommended that more involved elements on the ECTA framework could be beneficial for those policy makers who have an economic imperative to establish the Middle East countries in the global market place.

A research framework is drawn to clarify the linkage between four phases and their associated components within the Electronic Commerce Technology Acceptance model (ECTA). The social stimulus factors presented by trust, culture, and sociology of technology, While the cognitive response presented by perceived advantage of EC, perceived usability of EC, and EC perception accuracy. The third phase (affective response) presented by sentiment toward EC acceptance, and finally behavioural response reflected by EC use intention. All mentioned factors within their phases are affecting individuals' sentiment toward performing a specific behaviour (adopting e-commerce technology). Figure 8 demonstrates the ECTA framework and its involved components.

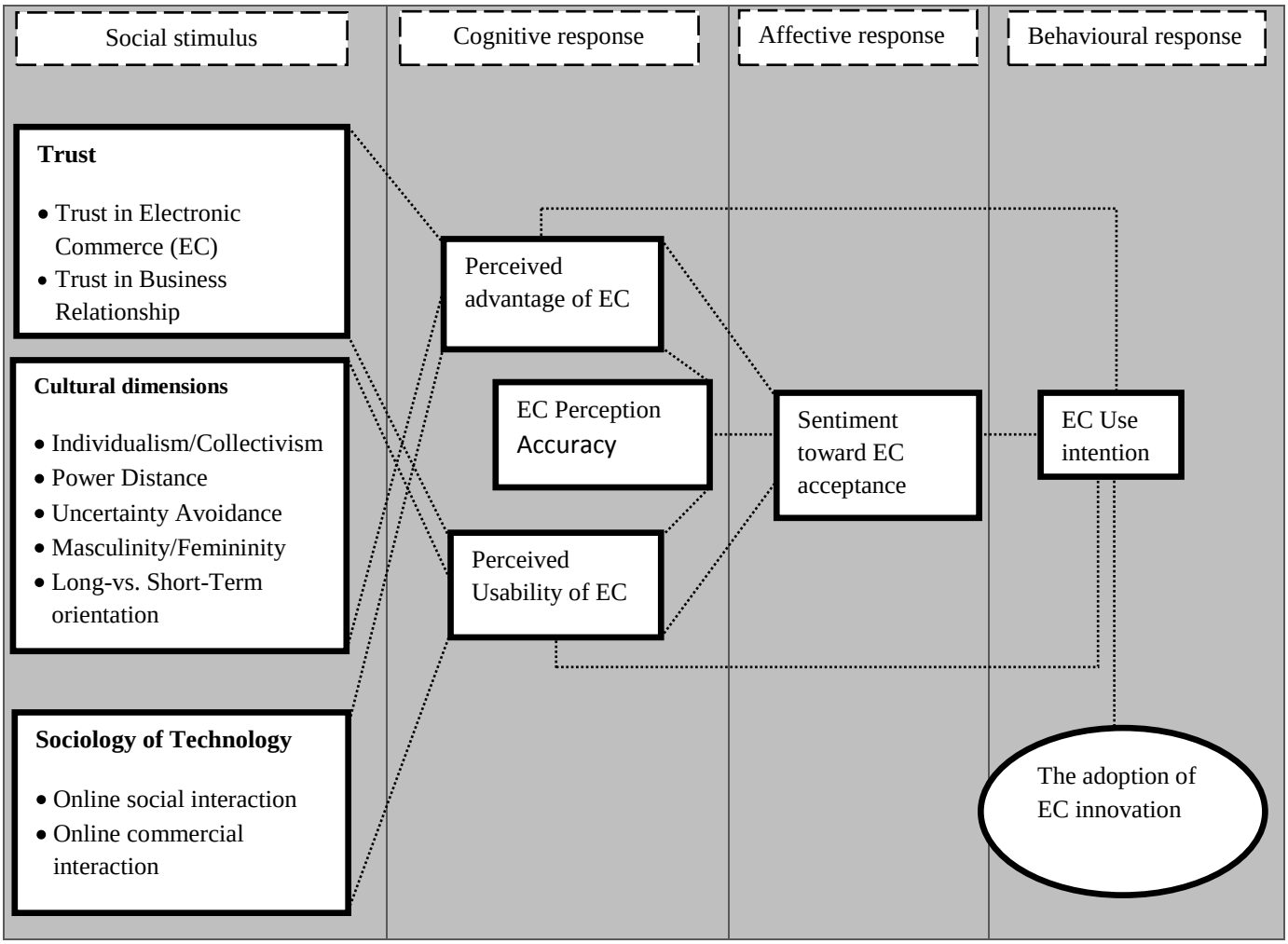

Figure 8. Electronic Commerce Technology Acceptance (ECTA) framework

Social Stimulus- these are the social factors (social affect) that influencing the cognitive response of individuals, which are in turn affecting an individual sentiment toward performing target behaviour. Social factors for this research framework are presented by trust, culture, and sociology of technology. In this research view, these factor influencing the acceptance and use of e-commerce technology in the Middle East countries, particularly Jordan.

Cognition Response- reflects an individual's feelings toward and evaluation of some object, person, issue, or event (Fishbein & Ajzen, 1975, p.12). Therefore, they affect an individual's beliefs, theories, expectancies, cause and impact beliefs, and perceptions related to the focal object. Their cognitive capacity has a great impact on the individuals'

decision making they form feelings toward the acceptance and adoption of E-commerce technology.

Affective Response -represents the affective constituents that are demonstrating the individuals' feelings with regards to the focal object for instance liking, anxiety, or upset. According to Social Cognitive Theory (SCT), there are two constructs involved in the SCT; affect and anxiety. Affect represents the positive side while anxiety reflects the negative side of an individual's feeling. Based on the SCT model proposed by Compeau & Higgins (1995b), affect refers to an individual's liking for a specific behaviour whereas anxiety evokes emotional reactions toward performing a particular behaviour. These meanings fit and can be viewed as a subset of attitude.

Attitude refers to an individual's overall feeling of favourableness or unfavourableness toward some stimulus object (Fishbein & Ajzen, 1975, p.216), which is specifically based on individuals' evaluation regarding a particular object. In e-commerce acceptance view, individuals generally have sentiment toward e-commerce application in their business processes, these attitudes might be positive or negative (accept/ reject).

Precisely, sentiment (attitude) is mainly based on an individual's evaluation toward a specific object. Evaluation refers to an individual's judgment with respect to a specific object and considered as a core component of attitude. Evaluations implies the imputation of some degree of goodness or badness to an attitude object, positive or negative attitude toward an object referred to as evaluative component. Evaluations are function of cognitive, affect and behavioural intention of the object.

Auxiliary, according to the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the positive or negative evaluation of the possible outcomes of performing the behaviour of interest can be changed very quickly when certain events occur or when new information becomes available, which renders changes to the individual's beliefs. Accordingly, to change the individual's behavioural beliefs by providing him/her with new, relevant and persuasive information (Zawawi et al, 2008). For example the individual has to be warned and always be reminded regarding the consequences of the

right/wrong way of performing E-commerce technology and that the affect will not only be on the organisational level but it could also affect them severely.

Behavioural Response- symbolizes individuals' ambitions, expectations, goals, and predicted responses to the given object, which is forming the actual behaviour to use an object. Actual adoption of EC innovation directly affected by behavioural intention for the target of using technology such as E-commerce, Behavioural intention refers to individual's subject probability that he/she will perform a given behaviour (Fishbein & Ajzen, 1975). Behavioural intention motivates the performance of behaviour (Beck & Ajzen, 1991) since it is the effort that an individual planning to exert, the persistence, and the willingness to try to perform the behaviour (Beck & Ajzen, 1991). It is a behavioural disposition (Ajzen, 1988) that will be transformed into e-commerce adoption when an individual put effort, persist, and willing to perform the behaviour to appropriate time and opportunity (Ajzen, 1988).

2.8.1. The Research Framework Key Factors

2.8.1.1. Social stimulus

Trust

Trust has been examined within business and management studies through two major areas: E-commerce (Connolly and Bannister, 2007; Gefen *et al*, 2003; McKnight *et al*, 2002; Chen and Barnes, 2007; March, 2006) and business relations (Brown and Lockett, 2004; Mouzas et al, 2007). Trust has an enormous significance in both areas (Business, E-commerce) from perspective of researchers and practitioners particularly in the study of Small and Medium Enterprises (Brown and Lockett, 2004). Brown and Lockett (2004) stressed that trust is important for SMEs to significantly consider in the E-business adoption paradigm in order to avoid the threat of the disintermediation impact.

Trust has been defined from various viewpoints according to its nature. It is a social phenomenon, which has varied definitions relying on the content (McKnight et al, 2002). Nevertheless, Gefen et al (2005) have stated the definition of trust in EC study as *"the belief that another person or organization on whom one depends will behave in a socially*

acceptable manner-honest, caring and capable-in doing so will fulfil the trusting party's expectation". Gefen et al (2003) introduced a study with respect to IT adoption. The study suggested a model of trust in online shopping by integrating trust-based antecedents and technological attribute-based antecedents found in Technology Acceptance Model (TAM).

Culture

The proposed research is based on Hofstede's cogitation of culture as:" *the collective programming of the mind which distinguishes the members of one group or category of people from another*" (1997, p.5). Hofstede argued that people share a collective national character that reflects their cultural mental programming, which forms individual's values, beliefs, assumptions, expectations, attitudes, and behaviours. Additionally, he identified five dimensions along which national culture differ: power distance, uncertainty avoidance, individualism vs. collectivism, femininity vs. masculinity, and long-term vs. short-term orientations (Hofstede, 1980, 2001). One assertion by Hofstede that is significant to the proposed research that is culture *"is learned,*" not only *"inherited."* This sustains the belief theory that individuals can both learn and unlearn cultural traits based on environmental effects such as adopting e-commerce technology.

These cultural factors have various influences on technology adoption in different locations. Furthermore, the above mentioned dimensions were identified through a number of cross-cultural surveys conducted among IBM employees in the late 60s and early 70s. The survey involved over 70 countries worldwide and over 80,000 unique respondents. In this research these dimensions are employed since they have been widely cited and used in many cross-cultural studies. The use of these dimensions will allow for better understanding for the impact of these factors on e-commerce acceptance as well as will clarify measurements and examinations of culture. The following table (1) explains Hofstede's cultural dimensions and metaphors.

Table 1. Hofstede's Cultural Dimensions and Metaphors

Dimensions	Description
Individualism vs. collectivism	*"…describe the relationships between the individual and collectivity that prevails in a given society"* (Hofstede, 2001, p.209)
Power distance	Human inequality, *"inequality can occur in areas such as prestige, wealth and power; different societies put different weights on status consistency among these areas.*" (Hofstede, 2001,p.79)
Masculinity vs. femininity	Statistics and survey results show that women generally *"…attach more importance to social goals such as relationships, helping others, and physical environment, and men attach more importance to ego goals such as careers and money."* (Hofstede, 2001, p.279).
Uncertainty avoidance	This dimension reflects the natural human uncertainty about their future and how people *"… try to cope through the domains of technology, law, religion."* (Hofstede, 2001,p. 145)
Long-term vs. short term orientation	Long term orientation defined as *" fostering of virtues oriented toward future rewards, in particular perseverance and thrift"*, while short-term orientation described as *"the fostering of virtues related to the past and present, in particular respect for tradition, perseverance of 'face' and fulfilling social obligations"* (Hofstede, 2001, pp.261-262).

Sociology of Technology

Based on the literature review, the social aspect of technology (Internet) can be identified within two broad conceptual categories related to e-commerce sociology of technology: online social interactions and online commercial interactions. To be more precise, in this research Internet-based technology will be utilized as an online social and commercial interactions tool.

Social networks (e.g., My Space, Facebook, and You Tube) have made an important impact on how today's Internet users communicate, search for and share information (Swamynathan *et al*, 2008). Social networking as an emerging phenomenon holds attractive attributes and all interesting for both consumers and business (Qiao, 2008). Users can join networks, publish and maintain their personal profiles, and initiate links to their friends; hence, social links considered to be an evidence that a level of trust has been established between the linked users.

Social network could be a chat room, debate forum, or rating and comment function embedded in an e-shopping website, for instance a social recommendation system (Kim

& Srivastava, 2007). An e-commerce website can identify opinion leaders with high impact and maximize the effectiveness of marketing based on a social network surrounding opinion leaders; therefore, it can assist the firm to establish its competitive advantage differentiating from others. The focal notion of social networking is that valuation generated from trusts within particular social networks, and consequently, can improve profitability, effectiveness and efficiency of advertising (Qiao, 2008).

Although the Internet is often used to contact existing relationships, it also has the potential to create new relationships. Much of the hype surrounding the Internet has been about the possibility of people becoming immersed in relationships with people who they have never seen in "real life" (Boase & Wellman, 2004). Some researchers referred to the Internet portray users so taken with online relationships that their ties with offline friends and family recede into the background (e.g., Chayko, 2002; Kendall, 2002; Rheingold, 2000).

Most of work done has concentrated on the potential of the internet for social interaction. At the same time as marketers were focusing attention on 'the technology-induced transformation that are revolutionising the marketplace' (Parasuraman & Zinkhan, 2002, p.286) cumulatively, these two significant research development: that online commercial interaction can be successfully achieved using the Internet, and that people engage the Internet not just for commercial transactions, but also for social and personal reasons.

2.8.1.2. Cognitive Response

PERCEIVED ADVANTAGE (PA)

The degree to which a person believes that using a particular system would improve his/her job performance (Davis et al, 1989, P. 320). While outcome expectation is "the perceived likely consequences of using a computer" (Compeau et al, 1999, P.147), Relative advantage refers to "the degree to which an innovation is perceived as better that the idea it supersedes" (Rogers, 2003, P. 229). From these definitions, it is clear that they emphasis the advantages accrued from adopting technology. The terminology of

perceived usefulness is then applied and defined as the degree of advantage which an electronic commerce technology is perceived to contribute to the users, either at the individual or the organisational level.

PERCEIVED USABILITY (PU)

The degree to which an individual believes that using a particular system would be free of effort (Davis, 1989; Davis et al, 1989). Scholars argued that perceived ease of use is the extent to which a person accepts as true that using an existing method would be at no cost to that individual (Davis et al, 1989; Gefen & Straub, 2000; Al-gahtani, 2001, 2008). At first Rogers (1962) avowed perceived ease of use in the term that represents the degree to which an innovation is perceived not to be difficult to understand, learn or operate. Further, stated that perceived ease of use is the degree to which consumers perceive a new product or service as better than its alternatives (1983). Comparably, Zeithaml *et al* (2002) stressed that the degree to which an innovation is easy to understand or use could be considered as perceived ease of use.

Essentially, early in 1962, Rogers noted that understanding the technology leads to adaptation of innovation service/product by customers is known as ease of use. Lately, Chen and Barnes (2007) have empirically found that two technological features of the interface, chiefly perceived ease of use and perceived usefulness importantly affect customer adaptation intentions. Hence, e-commerce technology is usable, acceptable, and adaptable if it is viewed as easy as painless.

PERCEPTION ACCURACY

Perception is the process by which organisms interpret and organize sensation to produce a meaningful experience of the surrounding environment. Sensation also refers to the immediate, relatively unprocessed results of stimulation of sensory receptors in the eyes, ears, nose, tongue, or skin. More specifically, perception describes one's ultimate experience of the world and typically involves further processing of sensory input (Lindsay & Norman, 1977).

Information accuracy is playing a vital role in determining individuals' decision either to use or to not use the available information systems. O'Reilly (1982) investigated the use of information based on perceptions of quality and availability; and found that there is a significant positive relationship between the quality of information and the frequency of its use. Therefore, it is reasonable to assume that there will be a relationship would apply to the acceptance of an EC innovation.

2.8.1.3. Affective Response

SENTIMENT TOWARD EC ACCEPTANCE

"An individual's positive or negative feelings (evaluative affect) about performing the target behaviour" (Fishbein & Ajzen, 1975, p.216). Attitude toward Using is a function of beliefs, favourably or unfavourably towards the behaviour (Fishbein & Ajzen, 1975, p. 216). Fishbein and Ajzen (1975) stressed that adopting behaviour is an indirect consequence of the beliefs related to the consequences of an evaluation of such behaviour and consequences. It can be explained that if the outcome of behaviour is mentally evaluated to have benefit to the individual, he/she may intend to perform that behaviour but if it is evaluated to have disadvantages, he/she may decide not to perform the particular behaviour. The two constructs of SCT model, affect and anxiety, can be merged into this construct since affect represent the positive side while anxiety reflects the negative side of an individual's feeling. The attitude theory suggests that the more favourable attitude a person has towards a given product/service, the more likely that person is to buy or use the product/service. The overall attitude towards an object is expected to be related to behaviours towards the object (Ajzen & Fishbein, 1980).

2.8.1.4. Behavioural response

EC USE INTENTION

Fishbein and Ajzen (1975, p. 12) defined behavioural intention (BI) as "a person's intentions to perform various behaviours". Ambitions, expectations, goals, and predicted

responses to the attitude target are considerable factors in this respect (Pavlou, 2003). TAM submitted that the actual use of the systems is determined by the users' behavioural intentions to use the system, which is in turn jointly settled by the users' attitudes towards using the system and their perceived usefulness of the system (Davis et al, 1989). The individuals' evaluation regarding the outcome of performing the behaviour of interest relies on his/her beliefs recognised as behaviour beliefs; these are the salient or accessible beliefs that are required through learning, experience, and socialisation with others (Zawawi et al, 2008).

THE ACTUAL ADOPTION OF EC INNOVATION

Actual adoption is behaviour. Theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) proposed that beliefs lead to attitude, which leads to behavioural intention that leads to actual behaviour. From an organisational perspective, there should be a received return on their investment with an information systems acceptance; individuals must use the system (Yi & Hwang, 2003). Acceptance of the system thus is based on the individual's beliefs that the technology is beneficial, provides capabilities to complete tasks, is easy to use, and management will provide support to use the system (Baker-Eveleth & Stone, 2008). Therefore, to justify how sentiments towards electronic commerce technology are formed and how these sentiments relate to electronic commerce acceptance and usage involves a causal research. Identifying causal relationships between various variables and factors such as trust, culture, sociology of technology, sentiment towards e-commerce acceptance, perceived advantage of adopting e-commerce technology, perceived usability of e-commerce technology, perception accuracy of EC, and electronic commerce technology adoption and usage.

The proposed study posits that the application of Electronic Commerce Technology Acceptance framework will allow for more effective and efficient adoption of e-commerce within SMEs in the Middle East. Accordingly, the following hypotheses, utterly formulated in the setting of the Middle East countries, are predicted to be true. Hence, the questions employed in the questionnaire will attempt to sustain all of these hypotheses.

Table 2. Main and Associated Hypotheses for ECTA framework

Hypotheses		Independent Variable	Dependent Variable
Main	**Sub**		
H1		**Trust**	**Perceived Advantage (PA)**
	$H1_a$	❖ Trust in e-commerce technology	
	$H1_b$	❖ Trust in business relationship	
H2		**Trust**	**Perceived Usability(PU)**
	$H2_a$	❖ Trust in e-commerce technology	
	$H2_b$	❖ Trust in business relationship	
H3		**Culture**	**Perceived Advantage (PA)**
	$H3_a$	❖ Individualism/Collectivism (IC)	
	$H3_b$	❖ Power Distance (PD)	
	$H3_c$	❖ Uncertainty Avoidance (UA)	
	$H3_d$	❖ Masculinity/ Femininity (MF)	
	$H3_e$	❖ Long vs. Long-Term Orientation (LST)	
H4		**Culture**	**Perceived Usability(PU)**
	$H4_a$	❖ Individualism/Collectivism (IC)	
	$H4_b$	❖ Power Distance (PD)	
	$H4_c$	❖ Uncertainty Avoidance (UA)	
	$H4_d$	❖ Masculinity/ Femininity (MF)	
	$H4_e$	❖ Long vs. Long-Term Orientation (LST)	
H5		**Sociology of Technology**	**Perceived Advantage (PA)**
	$H5_a$	❖ Online social interaction	
	$H5_b$	❖ Online commercial interaction	
H6		**Sociology of Technology**	**Perceived Usability(PU)**
	$H6_a$	❖ Online social interaction	
	$H6_b$	❖ Online commercial interaction	
H7	$H7_a$	**Perceived Advantage (PA)**	**E-Commerce Perception Accuracy (ECPA)**
	$H7_b$	**Perceived Usability(PU)**	
H8	$H8_a$	**Perceived Advantage (PA)**	**Sentiment Toward E-Commerce Acceptance (STECA)**
	$H8_b$	**Perceived Usability(PU)**	
	$H8_c$	**Electronic Commerce Perception Accuracy (ECPA)**	
H9	___	**Sentiment Toward E-Commerce Acceptance (STECA)**	**Use Intention (UI)**
H10	___	**Perceived Advantage (PA)**	**Use Intention (UI)**
H11	___	**Perceived Usability(PU)**	**Use Intention (UI)**
H12	___	**Use Intention (UI)**	**Electronic Commerce Innovation Adoption (ECIA)**

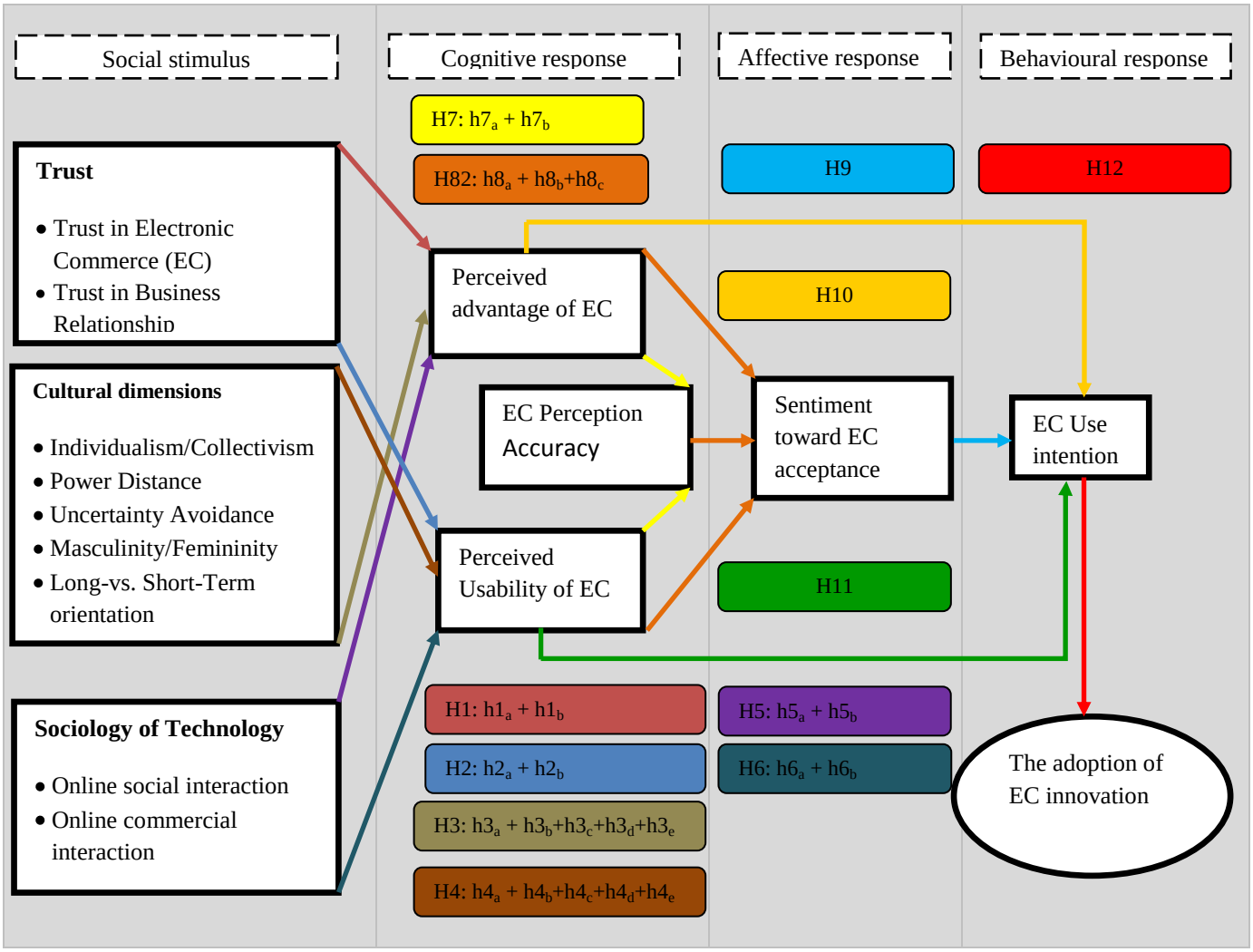

Figure 9. Main Effects and Associated Hypotheses for ECTA framework

Table 3. Summary of the Research hypotheses

Research Hypothesis	
H1	There will be a positive relationship between trust and perceived Advantage of e-commerce technology.
$H1_a$	There will be a positive relationship between trust in EC technology and perceived Advantage of e-commerce technology.
$H1_b$	There will be a positive relationship between trust in business relationship and perceived Advantage of e-commerce technology.
H2	There will be a positive relationship between trust and perceived Usability of e-commerce technology.
$H2_a$	There will be a positive relationship between trust in EC technology and perceived Usability of e-commerce technology.
$H2_b$	There will be a positive relationship between trust in business relationship and perceived Usability of e-commerce technology.
H3	There will be a positive relationship between culture and perceived Advantage of e-commerce technology.
$H3_a$	There will be a positive relationship between Individualism/Collectivism and perceived Advantage of e-commerce technology.
$H3_b$	There will be a positive relationship between Power Distance and perceived Advantage of e-commerce technology.
$H3_c$	There will be a positive relationship between Uncertainty Avoidance and perceived Advantage of e-commerce technology.
$H3_d$	There will be a positive relationship between Masculinity/ Femininity and perceived Advantage of e-commerce technology.
$H3_e$	There will be a positive relationship between Long vs. Long-Term Orientation and perceived Advantage of e-commerce technology.
H4	There will be a positive relationship between culture and perceived Usability of e-commerce technology.
$H4_a$	There will be a positive relationship between Individualism/Collectivism and perceived Usability of e-commerce technology.
$H4_b$	There will be a positive relationship between Power Distance and perceived Usability of e-commerce technology.
$H4_c$	There will be a positive relationship between Uncertainty Avoidance and perceived Usability of e-commerce technology.
$H4_d$	There will be a positive relationship between Masculinity/ Femininity and perceived Usability of e-commerce technology.
$H4_e$	There will be a positive relationship between Long vs. Long-Term Orientation and perceived Usability of e-commerce technology.
H5	There will be a positive relationship between sociology of technology and perceived Advantage of e-commerce technology.
$H5_a$	There will be a positive relationship between online social interaction and perceived Advantage of e-commerce technology.
$H5_b$	There will be a positive relationship between online commercial interaction and perceived Advantage of e-commerce technology.
H6	There will be a positive relationship between culture and perceived Usability of e-commerce technology.
$H6_a$	There will be a positive relationship between online social interaction and perceived Usability of e-commerce technology.
$H6_b$	There will be a positive relationship between online commercial interaction and perceived Usability of e-commerce technology.

$H7_a$	There will be a positive relationship between perceived Advantage and E-Commerce Perception Accuracy.
$H7_b$	There will be a positive relationship between perceived Usability and E-Commerce Perception Accuracy.
$H8_a$	There will be a positive relationship between perceived Advantage and Sentiment Toward E-Commerce Acceptance.
$H8_b$	There will be a positive relationship between perceived Usability and Sentiment Toward E-Commerce Acceptance**.**
$H8_c$	There will be a positive relationship between E-Commerce Perception Accuracy and Sentiment Toward E-Commerce Acceptance.
H9	There will be a positive relationship between Sentiment Toward E-Commerce Acceptance and E- Commerce Use Intention.
H10	There will be a positive relationship between perceived Advantage and E- Commerce Use Intention.
H11	There will be a positive relationship between perceived Usability and E- Commerce Use Intention.
H12	There will be a positive relationship between E- Commerce Use Intention and Electronic Commerce Innovation Adoption.

3. Research Methodology

With reference to the problem statement in the current study, it seems that there is an inadequate framework for investigating the factors affecting the adoption of e-commerce technology. The existing adoption models are insufficient in appropriately illuminating which factors are involved in the adoption decision and which factors are more effective, and are particularly inadequate with respect to SMEs. In reaction to this, it has been viewed that the survey research strategy is the most applicable. Precisely, the author's philosophical standpoint lies in a combined territory implying positivism and post-positivism which typically apply inductive and deductive research approach to test and verify existing theories in a new context. The generalisation of the research findings from positivism depends on statistical probability and large sample size .Whereas, the findings of pos positivism are not used to test a theory and make generalisation about populations; but rather, to build a theory for further testing, through quantitative methods (Aaker *et al*, 2001; Marshall & Rossman, 1995).

The viewpoint of Punch (2005) that the research design situates the researcher in the empirical world and connects the research questions to data. Furthermore, described the

research design as basic plan for research. It includes four ideas; research strategy, conceptual framework, question of who or what will be studied, and tools and procedures to be used for collecting and analysing empirical materials.

In the undertaken study, the metaphor of triangulation in a mixed approach is used through semi-structured interviews, survey questionnaire and document examination (see figure 10) which is applied in the study for several reasons:

The research is designed to explore, examine, and assess the adoption and acceptance of e-commerce technology by SMEs in Jordan. Hence, there will be many complex, social and behavioural variables as well as relationships, which need to be explored in detail and which require **a qualitative approach.** This approach is appropriate since the social world in business is complex and unique; therefore, it is difficult to theories in the same way as the physical science (Saunder *et al*, 2000; Remenyi *et al*, 1998).

It is important to apply **a quantitative approach** in this research, in view of the fact that, there are some elements which need to be investigated by quantitative tools for instance trust, cultural beliefs, sociology of technology ,attitude toward using e-commerce, perceived usefulness of EC, perceived ease of use of EC, behavioural intention to accept EC.

Document examination encompassing information about e-commerce gathered conceptually information via books, journals, official reports, periodicals, statements, and Internet. This provides better understanding of the research problem and findings. all mentioned sources regarding e-commerce as phenomena, e-commerce impact on SMEs, SMEs and E-commerce in Jordan, and adoption of innovation; are assisted the researcher to be able to gain a boarder view and a deeper understanding of e-commerce influence on SMEs this way. Moreover, Internet will be used in order to chase the latest information about e-commerce phenomenon and what affect SMEs decision adoption.

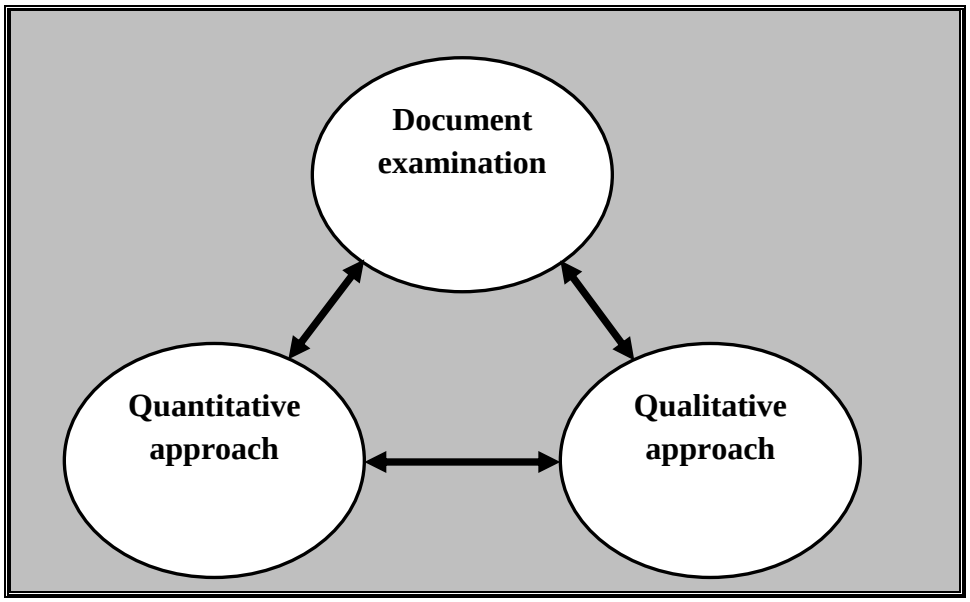

Figure 10. Triangulation approach embraced in this study

Furthermore, the study is based on exploratory and explanatory research designs. Additionally, it is possible to apply other research strategies for exploratory and explanatory research. The survey is a well-recognised practical research strategy available to measure concepts, and perception from a large population in comparison to other strategies. The findings from the survey are typically replicable and can be built on statistical probability. The strength of the survey strategy leads to solid research results. Thus, the survey research strategy is chosen and applied to conduct this study. Quantitative data is required priory to examine the comprehensive framework of E-commerce technology adoption through the associated factors of Electronic Commerce Technology Acceptance framework (ECTA) presented via four phases and their components; (Trust: Trust in EC, Trust in Business Relationship); (Culture: Individualism/Collectivism, Power Distance, Uncertainty Avoidance, Masculinity/ Femininity, and Long-vs. Short-term Orientation); and (Sociology of Technology: Online Social interaction, Online Commercial Interaction) as independent variables. In addition, cognitive, affective, and behavioural response phases' components; (cognitive response: Perceived Advantage of EC, Perceived Usability of EC, and EC Accuracy); (affective response; Sentiment towards EC Acceptance); and (behavioural response; EC Use Intention) as intermediate variables, dependent on other independent variables.

The complementary for quantitative research is qualitative research in order to enable the author extensive 'in-depth' and 'real' information on how e- commerce technology will be accepted and used by SMEs in Jordan. The following figure (11) demonstrates the methodology process adopted in this study.

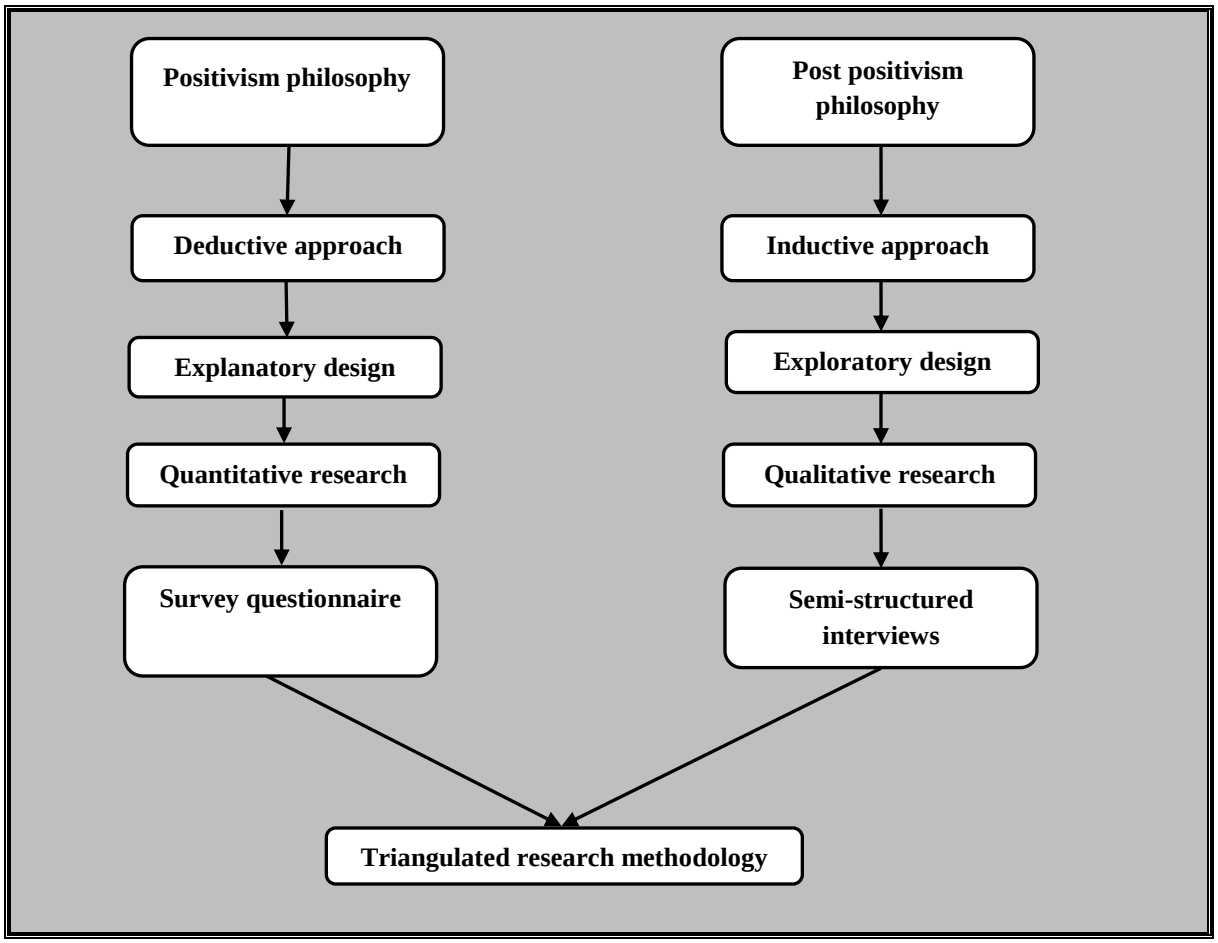

Figure 11. The Adopted Methodology Process Presented in this study

Thus, quantitative and qualitative methods are two abroad approaches are applied for this research. While quantitative research encompasses numerical representation and manipulation of observation for the purpose of describing and explaining phenomena that those observations reflect. Qualitative research from another aspect implies non-numerical investigation and interpretation of observations, for the purpose of discovering the underlying meaning and patterns of relationships (Babbie, 2004). Based on that, questionnaire construction and sampling procedures must be carefully organised.

The actual sample size was approximately 358. However, the number of 400 was used; hence, the final sample size for this study was 400. The table 4.4 summarises the calculated number of sample size argued above.

Table 4. Summary of the Calculated Number for the Sample Size

Minimum sample size	Estimated response rate	Actual sample size	Adjusted sample size required
384	50%	358	400

Ten participants were targeted and interviewed independently. The following table classified key informants/experts with their specified positions.

Table 5. Targeted Participants with their classifications and positions

Classification	Position	Quantity
Manager	Executive manager	1
Manager	Registration and development manager	1
Manager	Sales and marketing manager	1
Manager	General manager	1
Director	Member of the board of directors	1
Consultant	Finance and administrative advisor	1
Owner	General manager	1
IT	Wireless software manager	1
IT	Web art solution manager	1
Head	Head of E-commerce project management unit in Jordan	1

3.1. Data analysis and results

The analysis process is conducted within three phase and three different statistics, as articulated in figure 12.

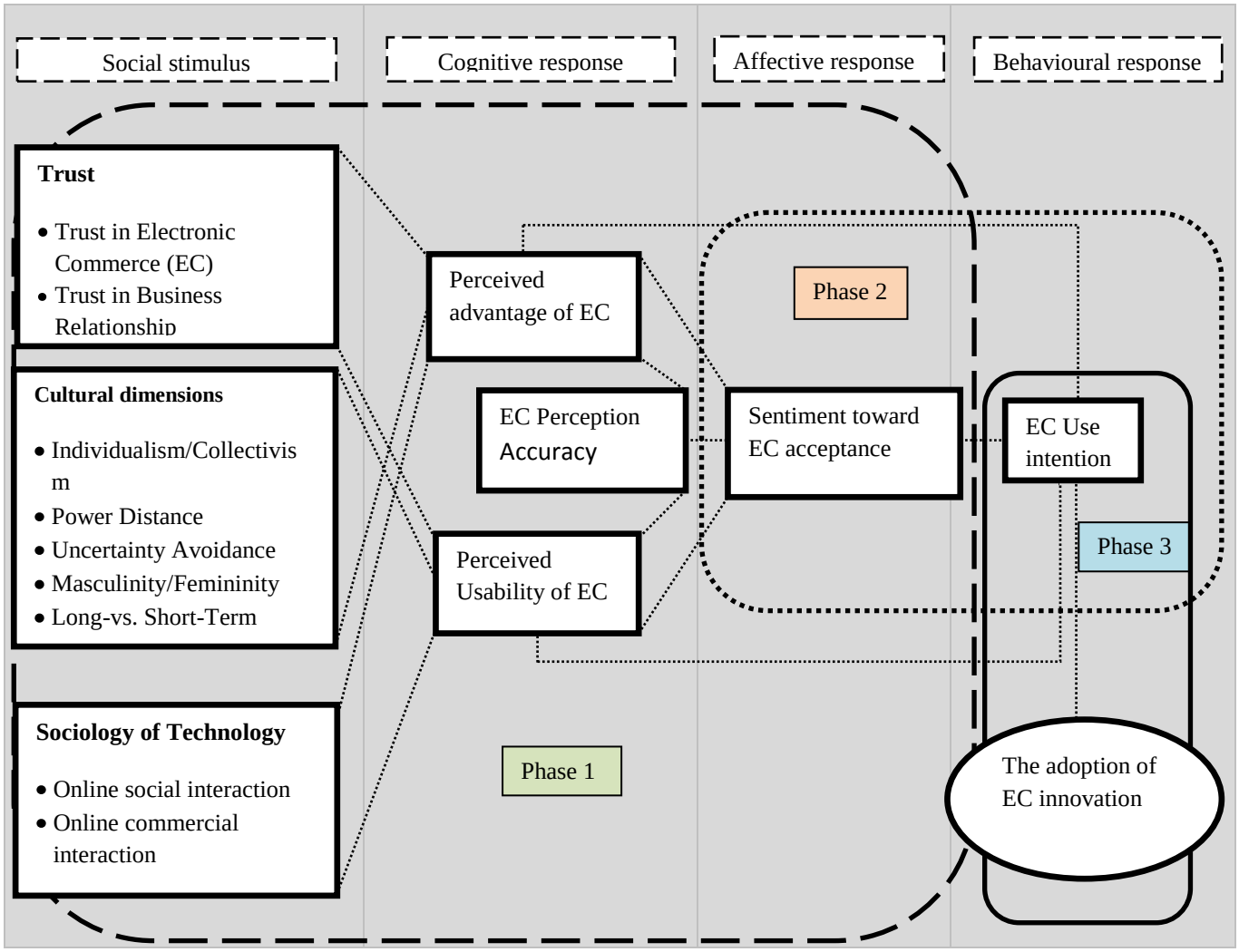

Figure 12. Analysis Techniques Classified within Three Phases

This research is aimed at testing the Electronic Commerce Technology Acceptance (ECTA) framework. The variables and sub-variables of this framework will be analysed within various ways implying Multiple Linear Regression, Simple Linear Regression, and One-way ANOVA.

In the first phase, multiple regressions analysis is used to predict the relative contribution of trust, culture, and sociology of technology to the outcome variables, perceived advantage (PA), and perceived Usability (PU). Thus, trust, culture, and sociology of technology as independent variables predict the relationships with dependent variables (PA and PU). In addition, multiple regressions analysis is used to predict the relationships between PU, PU and E-Commerce Perception Accuracy (ECPA). PU and

PU, and ECPA as independent variables predict the relationships with the dependent variable Sentiment toward E-Commerce Acceptance (STECA).

In the second phase, simple linear regression analysis is used to figure the contribution of STECA to the outcome variable, Use Intention (UI). Resemble, the independent variable PU predicts the relationship with the dependent variable UI. Likewise, the independent variable PA predicts the relationship with the dependent variable UI.

Finally, in the third phase, one-way analysis of Variance (ANOVA) is used to find whether or not there is a significant difference in people Use Intention (UI) during the adoption of e-commerce innovation.

To sum up, the following table (6) presents the research framework to illustrate the significant relationships of the regression.

Table 5.23 Summaries of Type's Data Analysis and Results for Each Research phase

Phase	Analysis Type	Hypotheses		Independent Variable	Dependent Variable	Result of the Analysis
		Main	Sub			
1	Multiple Linear Regression	**H1**	$H1_a$ $H1_b$	Trust ○ Trust in Electronic Commerce (TEC) ○ Trust in Business Relationship (TBR)	Perceived Advantage	0.164 0.000***
		H2	$H2_a$ $H2_b$	Trust ○ Trust in Electronic Commerce (TEC) ○ Trust in Business Relationship (TBR)	Perceived Usability	0.005*** 0.000***
		H3	$H3_a$ $H3_b$ $H3_c$ $H3_d$ $H3_e$	Culture ○ Individualism/Collectivism (IC) ○ Power Distance (PD) ○ Uncertainty Avoidance (UA) ○ Masculinity/Femininity (MF) ○ Long Vs. Short-Term Orientation (LST)	Perceived Advantage	0.000*** 0.135 0.000*** 0.000*** 0.768
		H4	$H4_a$ $H4_b$ $H4_c$ $H4_d$ $H4_e$	Culture ○ Individualism/Collectivism (IC) ○ Power Distance (PD) ○ Uncertainty Avoidance (UA) ○ Masculinity/Femininity (MF) ○ Long Vs. Short-Term Orientation (LST)	Perceived Usability	0.000*** 0.716 0.000*** 0.000*** 0.025**
		H5	$H5_a$ $H5_b$	Sociology of Technology ○ Online Social Interaction (OSI) ○ Online Commercial Interaction (OCI)	Perceived Advantage	0.000*** 0.000***
		H6	$H6_a$ $H6_b$	Sociology of Technology ○ Online Social Interaction (OSI) ○ Online Commercial Interaction (OCI)	Perceived Usability	0.000*** 0.000***
		H7	$H7_a$ $H7_b$	○ Perceived Advantage (PA) ○ Perceived Usability (PU)	E-Commerce Perception Accuracy (ECPA)	0.000*** 0.000***
		H8	$H8_a$ $H8_b$ $H8_c$	○ Perceived Advantage (PA) ○ Perceived Usability (PU) ○ Electronic Commerce Perception Accuracy (ECPA)	Sentiment Toward E-Commerce Acceptance (STECA)	0.000*** 0.000*** 0.000***
2	Simple Linear Regression	**H9**	----	Sentiment Toward E-Commerce Acceptance (STECA	Use Intention (UI)	0.000***
		H10	----	Perceived Advantage (PA)	Use Intention (UI)	0.000***
		H11	----	Perceived Usability (PU)	Use Intention (UI)	0.000***
3	ANOVA	**H12**	----	Use Intention (UI)	Electronic Commerce Innovation Adoption (ECIA)	0.006***

Statistical Significance:

*** Correlation is significant at <0.01

** Correlation is significant at <0.05

* Correlation is significant at <0.10

4. Conclusion

The research's main area was "Electronic Commerce Technology Acceptance framework for Small and Medium-sized Enterprises in Middle East countries with focus on the Jordan context.

This research aimed at contributing to the knowledge with respect to electronic commerce in Jordan. This was accomplished by identifying which factors are important for spurring willingness to adopt electronic commerce by SMEs in Jordan.

Precisely, this research dealt with the interactions and relationships between the electronic commerce technology acceptance (ECTA) framework components and phases: social stimulus (trust, culture beliefs, sociology of technology), cognitive response (perceived advantage, perceived usability, EC perception accuracy), affective response (sentiment towards EC acceptance), and behavioural response (EC us intention).

the empirical support for the proposed research framework based on the metaphor of triangulation in a mixed approach through semi-structured interviews, survey questionnaire and document examination; a mixed method approach was used in the main study utilising both quantitative and qualitative data. Also it was shown that this has a potential to be generalised to a nation-wide general organisational study.

The proposed comprehensive research framework is empirically examined with electronic commerce in the context of SMEs. The findings provide evidence supporting the validity and reliability of the framework. The majority of determinant factors in the framework are able to cause an influence upon the adoption of electronic commerce. Consequently, it could be claimed that this comprehensive research framework can be used as a research tool in investigating determinant factors in the decision to adopt other technological innovations.

The findings from the data analysis of both survey questionnaire and semi-structured interviews showed that the ECTA framework is beneficial to both governmental and

private sectors who intend to accelerate the adoption rate of electronic commerce implementations and their relevant components among SMEs in Jordan.

5. References

Aaker, D.A., Kumar, V. and Day, G.S. (2001) *Marketing Research*, 7th ed. Johan Wiley & sons. New York.

Ajzen, I. (1985) From Intentions to Actions: A theory of planned behaviour. In: *J.Kuhl & J.Beckman (Eds), Action-control: from cognition to behaviour*, Heidelberg: Spinger, pp.11-39.

Ajzen, I. (1991) the Theory of Planned Behaviour. *Organisational Behaviour and human decision processes*, 50 (2), pp. 179-211.

Ajzen, I. and Fishbein, M. (1980) *Understanding Attitudes and Predicting Social Behaviour*. New Jersey: Prentice-Hall, Inc., Englewood Cliffs.

Al-gahtani, S. (2001) the Applicability of TAM outside North America: An Empirical Test in the United Kingdom. *Information Resources Management Journal*, 14 (3), pp.37-46.

Al-gahtani, S. (2008) Testing for the Applicability of the TAM Model in the Arabic Context: Exploring an Extended TAM with three Moderating Factors. *Information Resources Management Journal*, 21 (4), pp. 1-26.

Babbie, E. R. (2004) *the practice of social research*, 10th ed. Belmont, CA: Wadsworth Thomson Learning.

Bagozzi, R. (2007) the Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift. *Journal of the Association for Information Systems*, 8 (4), pp.244-254.

Baker-Eveleth, L. and Stone, R.W. (2008) Expectancy Theory and Behavioural Intentions to Use Computer Application. *Interdisciplinary Journal of Information, Knowledge, and Management*, 3, pp. 135-145.

Bandura, A. (1986) *Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice Hall.

Beck, L. and Ajzen, I. (1991) Predicting Dishonest Actions Using the Theory of Planned Behaviour. *Journal of Research in Personality*, 25, pp. 285-301.

Boase, J. and Wellman, B. (2004) *Personal Relationships: On and Off the Internet*. Available from:http://www.chass.utoronto.ca/~wellman/publications/personal_relations/Personal_Relationships-On_and_Off_the_Internet-jul19.pdf [Accessed on 9/06/2010].

Brown, D. H. and Lockett, N. (2004) Potential of Critical E-Applications for Engaging SMEs in E-Business: A Provider Perspective. *European Journal of Information Systems*, 13, pp. 21-34.

Chau, S.B. and Turner, P. (2002) A framework for Analysing Factors Influencing Small to Medium Sized Enterprises SMEs Ability to Derive Benefit from the Conduct of Web Based Electronic Commerce (EC)- 34 Australian case studies". In: *Proceeding of the 10th European Conference on Information Systems*, pp.625-639, Gdansk: Poland.

Chayko, M. (2002) Connecting: How We Form Social Bonds and Communities in the Internet Age. Albany, NY: State University of New York Press.

Chen, Y.H. and Barnes, S. (2007) Initial Trust and Online Buyer Behaviour. *Industrial Management and Data*, 107 (1), pp. 21-36.

Chow, W.S. and Chan, L.Sh. (2008) Social Network, Social Trust and Shared Goals in Organisational Knowledge Sharing. *Information and Management*, 45, pp. 458-465.

Compeau, D.R. and Higgins, C.A. (1995a) Application of Social Cognitive Theory to Training for Computer Skills. *Information Systems Research*, 6 (2), pp. 118-143.

Compeau, D.R. and Higgins, C.A. (1995b) Computer Self-Efficacy: Development of A Measure and Initial Test. *MIS Quarterly*, 19 (2), pp. 189-211.

Compeau, D.R., Higgins, C.A. and Huff, S. (1999) social cognitive theory and individual reactions to computing technology: a longitudinal study. *MIS Quarterly*, 23 (2), pp. 145-158.

Connelly, R., and Bannister, F. (2007) Consumer Trust in Electronic Commerce: Social & Technical Antecedents. In: *Proceedings for World Academy of Science, Engineering and Technology*, 25, PP.386-395.

Davis, F.D. (1986) A Technology Acceptance Model for Empirically Testing New End-user Information Systems: Theory and Results, In: *MIT Sloan School of Management*, Cambridge, MA: Mit Sloan School of Management.

Davis, F.D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*,13(3), pp. 319-340.

Davis, F.D. (1993) User Acceptance of Information Technology: System Characteristics, User Perceptions and Behavioural Impacts. *International Journal of Man-Machine Studies*, 38(3), PP.475-487.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989) User Acceptance of Computer Technology: A Comparison of two Theoretical Models. *Management Science*, 35(8), pp. 982-1003.

Deroian, F. (2002) Formation of Social Network and Diffusion of Innovations. *Research Policy*, 31, pp.835-846.

Fishbein, M. & Ajzen, I. (1975) *Belief, Attitude, Intention, and Behaviour: An Introduction to Theory and Research,* Addison-Wesley Pub. Co.

Fishbein, M. (1980) a Theory of Reason Action: some Applications and Implications. In: *How, H. and Page, M. (EDS.), Nebraska Symposium on Motivation, University of Nebraska Press*, Lincoln, NB, 1979, pp. 65-116.

Fishbein, M. (1980) a Theory of Reason Action: some Applications and Implications. In: *How, H. and Page, M. (EDS.), Nebraska Symposium on Motivation, University of Nebraska Press*, Lincoln, NB, 1979, pp. 65-116.

Gefen, D. and Straub, D. (2000) the Relative Importance of Perceived Ease-of-Use in IS Adoption: A Study of E-Commerce Adoption. *JAIS*, 1(8), pp.1-30.

Gefen, D., Karahanna, E. and Straub, D.W. (2003) Trust and TAM in Online Shopping: An Integrated Model. *Management Information Systems Quarterly*, 27 (1), pp. 51-90.

Gefen, D., Rose, G., Warkentin, M. and Pavlou, P. (2005) Cultural Diversity and Trust in IT Adoption: A Comparison of Potential E-Voters in the USA and South Africa. *Journal of Global Information Management*, 13(1), pp. 54-78.

Hill, T. Smith, N.D. and Mann, M.F. (1986) Communicating Innovations: Convincing Computer Phobics to Adopt Innovative Technologies. *Advances in Consumer Research*, 13(1), pp. 419-422.

Hill, T. Smith, N.D. and Mann, M.F. (1987) Role of Efficacy Expectations in Predicting the Decision to Use advanced Technologies: The Case of Computers. *Journal of Applied Psychology*, 72 (2), pp. 307-313.

Hofstede, G. (1997) *culture and organizations: software of the mind*. London: Mc Graw Hill.

Hofstede, G. (2001) *Culture's Consequences- Comparing Values, Behaviours, Institutions, and Organizations across Nations*, (2nd Ed). SAGE Publications, Thousand Oakes: United States.

Hofstede, Greet (1980) *Culture's Consequences: International Differences in Work-Related Values*. Sage, Beverly Hills

Ihlstrum, C., Magnusson, M., Scupola, A. and Tuunainen, V.K. (2003) "SME Barriers to Electronic Commerce Adoption: Nothing Changes-Everything is New". Available from: <http://www.brnt.hcinut.edu.vn.MIS/Reading%20materials/SME%Barriers%20Electronic%20commerce.pdf> [Accessed on 02/6/2010].

Kendall, L. (2002) Hanging Out in the Virtual Pub: Masculinities and Relationships Online. Berkeley: University of California Press.

Kim, D.J., Song, S., Braynove, B. and Rao, H.R. (2005) A Multidimensional Trust Formation Model in B-to-C E-Commerce: A Conceptual Framework and Content Analysis of Academia/Practitioner Perspectives. *Decision Support Systems*, 40 (2), pp. 143-165.

Lindsay, P.H., and Norman, D.A. (1977) Human Information Processing: An Introduction to Psychology. New York: Academic Press.

Liu, L., and Ma, Q. (2006) Perceived System Performance: A Test of an Extended Technology Acceptance Model. *The DATA BASE for advances in Information Systems*, 37(2-3), pp. 51-59.

Lukas, H.C. and Spitler, V.K. (1999) Technology Use and Performance: A Field Study of Broker Workstations. *Decision Science*, 30(2), pp. 291-311.

Malhotra, Y. and Galletta, D. (1999) Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation. In: *Proceedings of the 32nd Hawaii International Conference on System Sciences IEEE*.

Mao, E. and Palvia, P. (2006) Testing an Extended Model of IT Acceptance in the Chinese Cultural Context. *The DATA BASE for advances in Information Systems*, 37(2-3), pp. 20-32.

March, S.H. (2006) Can the Building of Trust Overcome Consumer Perceived Risk Online? *Marketing Intelligent and Planning*, 24 (7), pp.746-761.

Marshall, C. and Rossman, G.B. (1999) *Designing Qualitative Research*, 3rd ed. Thousand Oaks: Sage Publications.

McKnight, D., Choudhury, V. and Kacmar, C. (2002) Developing and Validating Trust Measures for e-Commerce: An Integrative Typology. *Information Systems Research*, 13(3), pp. 334-359.

Mouzas, S., Henneberg, S. and Naude, P. (2007) Trust and Reliance in Business Relationships. *European Journal of Marketing*, 41 (9/10), pp.1016-1032.

O'Reilly, C.A. (1982) Variations in Decision Makers' use of Information Sources: The Impact of Quality and Accessibility of Information. *Academy of Management Journal*, 25(4), pp. 756-71.

Parasuraman, A. and Zinkhan, G. M. (2002) Marketing to and serving Customers through the Internet: an overview and research agenda. *Journal of the Academy of Marketing Science*, 30 (4), pp. 286-295.

Previte, J. (2005) *Understanding Everyday Internet Experience: Applications to Social Marketing Theory and Practice*. PhD thesis, Queensland University of Technology.

Punch, K (2005) Introduction to Social Research: Quantitative and Qualitative Approaches.2nd ed.Sage Publications. London

Qiao, Y. (2008) Social Networks and E-commerce. *Seminar on Internetworking*.

Rao, S. S, Metts, G. and Monge, C.A.M. (2003) "Electronic Commerce Development in Small and Medium Sized Enterprise: A stage Model and its Implications". *Business Process Management Journal, 9 (1), pp.11-32.*

Remenyi, d., Williams, B., Money, A. and Swartz, E. (1998) Doing Research in Business Management. SAGE Publications ltd. London.

Rheingold, H. (2000) *The Virtual Community* (Revised ed.). Cambridge, MA: MIT Press.

Rogers, E.M. (1962) *Diffusion of Innovation*. New York: the Free Press

Rogers, E.M. (1983) *Diffusion of Innovation*, 3rd ed. New York: the Free Press

Rogers, E.M. (1995) *Diffusion of Innovation*, 4th ed. New York: the Free Press

Rogers, E.M. (2003) *Diffusion of Innovation*, 5h ed. New York: the Free Press

Saunders, M., Lewis, P. and Thornhill, A. (2000) *Research methods for business students.* Prentice Hall.

Scannell, T.V. (1999) *Behavioural Models of Advanced Manufacturing Technology Selection*. PhD Thesis, Michigan State University, East Lansing, MI.

Simpson, M. and Docherty, A.J. (2004) "E-commerce Adoption Support and Device from UK SMEs". *Journal of Small Business and Enterprise Development*, 11 (3), pp.315-328.

Song, J. and Zahedi, F.M. (2001) Web Design in E-Commerce: A Theory and Empirical Analysis. In: *Proceedings of the International Conference of Information Systems, Portugal, July 2001*, pp.205-220.

Stockdale, R. and Standing, C. (2006) a classification Model to Support SME E-commerce Adoption Initiatives. *Journal of Small Business and Enterprise Development*, 13 (3), pp. 381-394.

Straub, D.W., Keil, M. and Brenner, W. (1997) Testing the Technology Acceptance Model across Cultures: A Three Country Study. *Information & Management*, 33(1), pp.1-11.

Swamynathan, G., Wilson, Ch., Boe, B., Almeroth, K. and Zhao, B.Y. (2008) Do Social Networks Improve E-Commerce? A Study on Social Marketplaces. In: *Proceedings of the WOSN'08, August 18, 2008*, Seattle, Washington, USA.

Turban, E., King, D., Lee, J. and Viehland, D. (2004) *"Electronic Commerce: A Managerial Perspective"*. New Jersey: Pearson/ Prentice Hall.

Venkatesh, V. and F.D. Davis (2000) a Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), pp.186-204.

Vijayasarathy, L.R. (2001) The Impact of Shopping Orientations, Product Type, and Shopping Aids on Attitude and Intention to Use Online Shopping. *Quarterly Journal of Electronic Commerce*, 2(2), pp.99-113.

Yi, M.Y. and Hwang, Y. (2003) Predicting the Use of Web-based Information Systems: Self Efficacy, Enjoyment, Learning Goal Orientation, and the Technology Acceptance Model. *International Journal of Human-Computer Studies*, 59, pp. 431-449.

Zawawi, S., Jusoff, K., Abdul Rahman, R. and Idris, K. (2008) Behavioural Intention for Fraudulent Reporting Behaviour Using Cognitive Theory. *Asian Social Science*, 4(7), pp. 43-47.

Zeithaml, VA., Parasuraman, A. and Malhotra, A. (2002) Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge. *Journal of the Academy of Marketing Science*, 30 (4), pp. 362-375.

Zwass, V. (2003) Electronic Commerce and Organisational Innovation: Aspects and Opportunities, *International Journal of Electronic Commerce*.